Derivation of test data curve fits - CO vs O_2

The CO operating curves for each OFA damper setting were calculated with a least squares fit through the data points using the following equation:

$$y = cx^b$$

where y is corrected stack CO (ppm), x is flue gas O_2%, c and b are constants.

The shape of the curves using this equation resemble published CO/excess air combustion curves. Plots of the CO data from all the OFA damper settings also show a power curve correlation to flue gas O_2.

The following tables show the test CO data points, derived constants, and r^2 values for each OFA damper setting test series.

No Overfire Air	
%O2	CO (ppm)
1.7	696
2.1	240
2.6	41
3.1	2.3
3.2	13
r^2 = 0.8916	
c = 47259	
b = -7.6817	

10% Overfire Air	
%O2	CO (ppm)
1.7	899
1.9	242
2.5	54
3.0	22
3.3	3
r^2 = 0.9568	
c = 66265	
b = -7.9824	

12% Overfire Air	
%O2	CO (ppm)
1.9	212
2.5	169
2.7	161
3.0	20
r^2 = 0.477	
c = 4029.2	
b = -4.0112	

14% Overfire Air	
%O2	CO (ppm)
2.0	302
2.4	50
2.7	43
3.8	33
r^2 = 0.7097	
c = 1372.4	
b = -3.0919	